AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (Currently amended) A boost converter for power factor correction, comprising:

a boost inductor, charged by a power source and discharging via a load;

a boost switch, closed for charging the boost inductor and opened for discharging the boost inductor; and

a controller for controlling the boost switch,

wherein the controller dynamically changes operation mode of the boost converter to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

2. (Original) The boost converter according to claim 1, further comprising a zero crossing voltage detector, receiving input voltage of the boost converter.

3. (Original) The boost converter according to claim 2, further comprising a voltage peak detector, detecting the magnitude of the input voltage with approximately 90 degree phase.

4. (Original) The boost converter according to claim 2, further comprising a voltage predictor, receiving signals from the zero crossing voltage detector, and predicting input voltage of a next instant.

5. (Original) The boost converter according to claim 1, wherein the controller further comprises a signal processor, receiving signals from the voltage predictor, and calculating a duty cycle and frequency of the boost switch.

6. (Original) The boost converter according to claim 5, wherein the signal processor is an ASIC.

7. (Original) The boost converter according to claim 1, further comprising a notch filter, receiving an output voltage of the boost converter.

8. (Original) The boost converter according to claim 7, wherein the notch filter is multi-tone.

9. (Original) The boost converter according to claim 1, further comprising a zero current detector, receiving an input current of the boost converter.

10. (Original) The boost converter according to claim 9, further comprising a voltage range estimator, receiving an input voltage of the boost converter.

11. (Original) The boost converter according to claim 9, further comprising a zero crossing detector, receiving an input voltage of the boost converter.

12. (Original) The boost converter according to claim 11, further comprising a period estimator, receiving signals from the zero crossing detector, and determining a period of the input voltage of the boost converter.

13. (Original) The boost converter according to claim 11, further comprising a phase generator, receiving signals from the zero crossing detector, and determining a phase of the input voltage of the boost converter.

14. (Original) The boost converter according to claim 9, further comprising a notch filter receiving an output voltage of the boost converter.

15. (Currently amended) A boost converter for power factor correction, comprising:

boost inductor means, charged by a power source and discharging via a load;

switching means, closed for charging the boost inductor and opened for discharging the boost inductor; and

means for controlling the switching means,

wherein the controlling means dynamically changes operation mode of the boost converter to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

16. (Original) The boost converter according to claim 15, further comprising means for detecting a zero crossing voltage of an input voltage of the boost converter.

17. (Original) The boost converter according to claim 16, further comprising means for detecting the magnitude of the input voltage with approximately 90 degree phase.

18. (Original) The boost converter according to claim 16, further comprising means for predicting input voltage of the next instant, receiving signals from the means for detecting zero crossing voltage.

19. (Original) The boost converter according to claim 15, wherein the controlling means further comprises means for calculating a duty cycle and frequency of the switching means, receiving signals from the predicting means.

20. (Original) The boost converter according to claim 19, wherein the calculating means is an ASIC.

21. (Original) The boost converter according to claim 15, further comprising means for filtering a frequency band of an output voltage of the power factor correction boost converter.

22. (Original) The boost converter according to claim 21, wherein the filtering means is multi-tone.

23. (Original) The boost converter according to claim 15, further comprising means for detecting a zero current of an input current of the boost converter.

24. (Original) The boost converter according to claim 23, further comprising means for estimating a voltage range of an input voltage of the boost converter.

25. (Original) The boost converter according to claim 23, further comprising means for detecting a zero crossing voltage of an input voltage of the boost converter.

26. (Original) The boost converter according to claim 25, further comprising means for estimating a period of the input voltage of the boost converter, receiving signals from the means for detecting the zero crossing voltage.

27. (Original) The boost converter according to claim 25, further comprising means for determining a phase of the input voltage of the boost converter, receiving signals from the means for detecting the zero crossing voltage.

28. (Original) The boost converter according to claim 23, further comprising means for filtering a frequency band of an output voltage of the boost converter.

29. (Currently amended) A method for controlling a boost converter for power factor correction, the boost converter comprising a boost inductor, a boost switch, and a controller, the method comprising:

dynamically changing operation mode of the boost converter to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

30. (Original) The method according to claim 29, further comprising calculating a turn on and turn off time of the boost switch.

31. (Original) The method according to claim 29, further comprising detecting a zero crossing point in an input voltage of the boost converter.

32. (Original) The method according to claim 29, further comprising detecting a magnitude of the input voltage with approximately 90 degree phase.

33. (Original) The method according to claim 29, further comprising predicting an input voltage at a next instant according to frequency and peak of the input voltage of the boost converter.

34. (Original) The method according to claim 29, further comprising calculating a duty cycle and frequency of the boost switch.

35. (Original) The method according to claim 29, further comprising removing a frequency band of output voltage of the boost converter.

36. (Original) The method according to claim 29, further comprising detecting a zero current point in an input current of the boost converter.

37. (Original) The method according to claim 36, wherein the controller changes the operation to critical mode when a zero current is detected.

38. (Original) The method according to claim 36, further comprising estimating a range of input voltage of the boost converter.

39. (Original) The method according to claim 36, further comprising detecting a zero crossing point in the input voltage of the boost converter.

40. (Original) The method according to claim 36, further comprising estimating a period of the input voltage of the boost converter.

41. (Original) The method according to claim 36, further comprising determining a phase of the input voltage of the boost converter.

42. (Original) The method according to claim 36, further comprising removing a frequency band of output voltage of the boost converter.

43. (Original) The method according to claim 36, wherein the operation mode changes according to a loading of the boost converter.

44. (Currently amended) A computer program product containing program code for performing a method comprising:

responsive to values corresponding to an input voltage and an output voltage of a power factor correction boost converter, calculating the turn on and turn off time of a boost switch of the power factor correction boost converter to dynamically change its operation mode to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

45. (Currently amended) A controller for controlling a boost switch of a power factor correction boost converter, said controller comprising:

a processor communicating with the boost switch, and responsive to an input voltage and an output voltage of the power factor correction boost converter to calculate a turn on and turn off time of the boost switch to dynamically change operation mode of the power factor correction boost converter to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

46. (Original) The controller according to claim 45, further comprising a zero crossing voltage detector, detecting a zero crossing point in the input voltage of the power factor correction boost converter.

47. (Original) The controller according to claim 46, further comprising a voltage peak detector, detecting the magnitude of the input voltage with approximately 90 degree phase.

48. (Original) The controller according to claim 46, further comprising a voltage predictor, receiving signals from the zero crossing voltage detector, and predicting the input voltage at a next instant.

49. (Original) The controller according to claim 46, further comprising a notch filter, receiving output voltage of the power factor correction boost converter.

50. (Original) The controller according to claim 49, wherein the notch filter is multi-tone.

51. (Currently amended) A controller for controlling a boost switch of a power factor correction boost converter, said controller comprising:

means, responsive to an input voltage and an output voltage of the power factor correction boost converter, for calculating a turn on and turn off time of the boost switch to dynamically change operation mode of the power factor correction boost converter to transition between two modes ~~selected from the group consisting of~~ among continuous mode, critical mode and discontinuous mode within one operational cycle.

52. (Original) The controller according to claim 51, further comprising means for detecting a zero crossing point in the input voltage of the power factor correction boost converter.

53. (Original) The controller according to claim 51, further comprising means for detecting the magnitude of the input voltage with approximately 90 degree phase.

54. (Original) The controller according to claim 52, further comprising means for predicting the input voltage at a next instant according to signals from the means for detecting zero crossing point.

55. (Original) The controller according to claim 51, further comprising means for filtering a frequency band of the output voltage of the power factor correction boost converter.

56. (Currently Amended) A controller for controlling a boost switch of a power factor correction boost converter, said controller comprising:

a zero current detector, receiving an input current of the power factor correction boost converter;

a zero voltage detector, receiving an input voltage of the power factor correction boost converter; and

a pulse width modulator, receiving signals from the zero current detector and the zero voltage detector, and dynamically changing operation mode of the power factor correction boost converter between continuous mode and critical mode within one operational cycle.

57. (Original) The controller according to claim 56, further comprising a voltage range estimator, receiving an input voltage of the power factor correction boost converter.

58. (Original) The controller according to claim 56, further comprising a period estimator, receiving signals from the zero voltage detector.

59. (Original) The controller according to claim 56, further comprising a phase generator, receiving signals from the zero voltage detector.

60. (Original) The controller according to claim 56, further comprising a notch filter, receiving the output voltage of the power factor correction boost converter.

61. (Currently Amended) A controller for controlling a boost switch of a power factor correction boost converter, said controller comprising:

means for detecting a zero current of an input current of the power factor correction boost converter;

means for detecting a zero voltage point of an input voltage of the power factor correction boost converter; and

means for dynamically changing an operation mode of the power factor correction boost converter between continuous mode and critical mode within one operational cycle responsive to the zero current detector and the zero voltage detector.

62. (Original) The controller according to claim 61, further comprising means for estimating a magnitude of the input voltage of the power factor correction boost converter.

63. (Original) The controller according to claim 61, further comprising means for estimating a period of the input voltage of the power factor correction boost converter responsive to the means for detecting zero voltage.

64. (Original) The controller according to claim 61, further comprising means for determining a phase of the input voltage of the power factor correction boost converter responsive to the means for detecting zero voltage.

65. (Original) The controller according to claim 61, further comprising means for filtering a frequency band of the output voltage of the power factor correction boost converter.